Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method for processing at least one signal sent by a transmitter, said signal preferably being used for measuring the range, i.e. the distance between said transmitter and a receiver, said signal comprising a carrier signal modulated by a pseudo random noise (PRN) code, said method comprising the steps of:

- mixing said signal with a replica of the carrier signal, to acquire a baseband signal, said baseband signal representing said PRN code,
- multiplying said baseband signal respectively with M+N+1 PRN code ~~replica's~~ replicas ($P_{-M}, \ldots, P_{+N}$), comprising one punctual replica (PO), M early replicas, and N late replicas, said ~~replica's~~ replicas being shifted in time with respect to each other, the value M+N+1 being at least equal to four, ~~one of said replica's being the punctual replica P_0,~~
- calculating the M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$) of said baseband signal with respect to each of said M+N+1 PRN code ~~replica's~~ replicas,
- calculating from said M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$), an estimate of the multipath error, said calculation being based on a predefined formula, said formula equating said multipath error to a predefined ~~function of said M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$), wherein said predefined formula is a~~ linear combination of said M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$), each of said values being normalized by the correlation value I_0 of said punctual replica P_0.

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2. (Currently Amended) A method according to claim 1, comprising the steps of:

- mixing said signal with a replica of the carrier signal, to acquire a baseband signal, representing said PRN code,
- multiplying said baseband signal respectively with three equally spaced ~~replica's~~ replicas (P_0, P_{-1}, P_{+1}) of said PRN code, namely an early (P_{-1}), punctual (P_0) and late (P_{+1}) replica, with a given early-late spacing (d),
- multiplying said baseband signal with at least one additional replica of said PRN code, said additional replica being shifted in time relative to said early, late and punctual ~~replica's~~ replicas, so that in total M+N+1 code ~~replica's~~ replicas are used, M+N+1 being at least equal to four,
- calculating the M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$) of said baseband signal with respect to each of the M+N+1 PRN code ~~replica's~~ replicas,
- locking the punctual code (P_0) to the baseband signal by keeping the two correlation values (I_{-1}, I_{+1}) between said baseband signal and said early and late ~~replica's~~ replicas (P_{-1}, P_{+1}) equal to each other,
- calculating the range by multiplying the delay of the punctual code (P_0) by the speed of light,
- calculating from said M+N+1 correlation values ($I_{-M}, \ldots, I_{+N}$), an estimate of the multipath error, said calculation being based on said predefined formula,
- filtering said estimate of the multipath error and subtracting said estimate of the multipath error from said calculated range, yielding a corrected range value.

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3. (Original) A method according to claim 1, wherein said linear combination is of the following form:

$$MP = \sum_{i=-M..N} \alpha_i \frac{1}{I_0} \frac{I_i}{1-|i|\frac{d}{2}}$$

wherein MP represents the multipath error, d represents the early-late spacing, I_0 represents the correlation value of said punctual replica, $I_{-M},\ldots, I_{+N}$ represent the correlation values, α_i represent M+N+1 fixed values.

4. (Currently Amended) A method according to claim 3, wherein every one of said M+N+1 ~~replica's~~ replicas is shifted over the same time delay with respect to the next and/or previous replica.

5. (Currently Amended) The method according to claim 3, wherein said α_i values are calculated according to the method comprising the steps of:

- simulating, for a fixed signal-to-multipath amplitude ratio and for different multipath delays, [[:]] the multipath range error and M+N+1 correlation values,
- using said simulated range errors and correlation values to obtain a system of equations, each equation equating the simulated multipath range error to a linear combination of the M+N+1 correlation values,
- obtaining said α_i values by solving said system of equations.

6. (Original) The method according to claim 5, wherein all except two of said α_i values may be set to zero.

7. (Currently Amended) The method according to claim 6, wherein said α_i values are calculated according to the method comprising the steps of:

- for a given signal-to-multipath amplitude ratio SMR and for a given number D of multipath delays, calculating the range error, for multipath in phase with a simulated line-of-sight signal and for multipath 180° out of phase with said simulated line-of-sight signal, thereby obtaining a vector y comprising 2D range error values,
- calculating, for each of the 2D range errors, the M+N+1 correlation values, and normalizing said correlation values by the correlation value I_0 of said punctual replica P_0, to obtain a (2D X (M+N+1)) matrix C,
- calculating the α_i values by solving the system of equations [[:]] y=C.α, wherein α is a vector comprising the M+N+1 α_i values.

8. (Original) The method according to claim 7, wherein the vector α is overdetermined by said system of equations and wherein said vector α is obtained by an optimization technique.

9. (Currently Amended) A method according to claim 3, wherein two ~~replica's~~ replicas are used in the estimation of the multipath error by setting α_{-1} and α_{+1} , by setting α_{-1} and α_{+1} equal to zero, and wherein the early-late spacing (d) is 1/15 of a chip length, and wherein the second replica (P_{+2}) is 1/15 of a chip length later than said punctual replica (P_0), and wherein said multipath error estimation (MP) is calculated as:

$$MP = -0.42 \cdot \left(1 - \frac{I_{+2}}{I_0} \frac{1}{1-d}\right)$$

10. (Currently Amended) A receiver for ranging applications, said receiver comprising a plurality of channels for detecting and locking onto a plurality of PRN encoded signals, each channel comprising:

- a delay line, comprising M+N+1 taps, M+N+1 being at least four, for obtaining M+N+1 PRN codes, one of which is a punctual code P_0, one a first early code P-1, and one a late code P+1, with an early-late spacing d between the early and late code,
- M+N+1 mixers and M+N+1 accumulators to calculate M+N+1 correlation values $(I_{-M}, \ldots, I_{+N})$,
- a multipath estimator module arranged to receive said M+N+1 correlation values, and to calculate a multipath error estimate MP, according to a predefined ~~formula, said formula being a~~ linear combination of said M+N+1 correlation values $(I_{-M}, \ldots, I_{+N})$, each of said values being normalized by the correlation value I_0 of said punctual replica P_0,
- a low pass filter arranged to receive the multipath estimation produced by the multipath estimator module.

11. (Original) The receiver according to claim 10, wherein said formula has the form:

$$MP = \sum_{i=-M..N} \alpha_i \frac{1}{I_0} \frac{I_i}{1-|i|\frac{d}{2}}$$

wherein MP represents the multipath error, d represents the early-late spacing, I_0 represents the correlation value of said

punctual replica, $I_{-M}, \ldots, I_{+N}$ represent the correlation values, α_i represent M+N+1 fixed values.

12. (Currently Amended) The receiver according to claim 11, wherein said α_i values are calculated by ~~according to the method comprising the steps of~~:

- ~~Simulating~~ simulating the multipath range error and M+N+1 correlation values, for a fixed signal-to-multipath amplitude ratio and for different multipath delays ~~: the multipath range error and M+N+1 correlation values~~,
- using said simulated range errors and correlation values to obtain a system of equations, each equation equating the simulated multipath range error to a linear combination of the M+N+1 correlation values,
- obtaining said α_i values by solving said system of equations.
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13. Cancelled

14. (Currently Amended) The receiver according to claim ~~13~~ 12, wherein said α_i values are calculated by ~~according to the method comprising the steps of~~:

- for a given signal-to-multipath amplitude ratio SMR and for a given number D of multipath delays, calculating the range error, for multipath in phase with a simulated line-of-sight signal and for multipath 180° out of phase with said simulated line-of-sight signal, thereby obtaining a vector y comprising 2D range error values,
- calculating, for each of the 2D range errors, the M+N+1 correlation values, and normalizing said correlation values by the correlation value I_0 of said punctual replica P_0, to obtain a (2D X (M+N+1)) matrix C,

- calculating the α_i values by solving the system of equations [[:]] $y=C.\alpha$, wherein α is a vector comprising the M+N+1 α_i values.

15. (Original) The receiver according to claim 14, wherein the vector α is overdetermined by said system of equations and wherein said vector α is obtained by an optimization technique.

16. (Currently Amended) The receiver according to claim 11, wherein two ~~replica's~~ replicas are used in the estimation of the multipath error by setting α_{-1} and α_{+1} , by setting α_{-1} and α_{+1} equal to zero, and wherein the early-late spacing (d) is 1/15 of a chip length, and wherein the second replica (P_{+2}) is 1/15 of a chip length later than said punctual replica (P_0), and wherein said multipath error estimation (MP) is calculated as[[:]]

$$MP = -0.42 \cdot \left(1 - \frac{I_{+3}}{I_0}\frac{1}{1-d}\right)$$

17. (Original) The receiver according to claim 10, wherein said multipath estimator module comprises software means for calculating the multipath error estimate on the basis of a predefined formula.

18. (Original) The receiver according to claim 10, wherein said multipath estimator module comprises hardware means for calculating the multipath error estimate on the basis of a predefined formula.

19. (Currently Amended) A method for estimating a ranging error due to multipath in a receiver, ~~said receiver~~ the method comprising:

providing a receiver including:

- a delay line, comprising M+N+1 taps, M+N+1 being at least four, for obtaining M+N+1 PRN codes, one of which is a punctual code P_0, one an early code P_{-1}, and one a late code P_{+1}, with an early-late spacing d between the early and late code,
- M+N+1 mixers and accumulators to calculate M+N+1 correlation values $(I_{-M},\ldots,I_{+N})$,
- a multipath estimator module to calculate a multipath error estimate (MP), according to the formula [[:]]
- $MP=\sum_{i=-M..N}\alpha_i\frac{1}{I_0}\frac{I_i}{1-|i|\frac{d}{2}}$ wherein MP represents the multipath error, d represents the early-late spacing, I_0 represents the correlation value of said punctual replica , $I_{-M},\ldots,I_{+N}$ represent the correlation values, α_i represent M+N+1 fixed values; ~~,~~

~~said method comprising the steps of:~~

- simulating the multipath range error and M+N+1 correlation values the multipath range error and M+N+1 correlation values, for a fixed signal-to-multipath amplitude ratio and for different multipath delays ~~: the multipath range error and M+N+1 correlation values~~,
- using said simulated range errors and correlation values to obtain a system of equations, each equation equating the simulated multipath range error to a linear combination of the M+N+1 correlation values,
- obtaining said α_i values by solving said system of equations.

20. Cancelled

21. (Currently Amended) The method according to claim ~~20~~ 19 comprising the steps of:

- for a given signal-to-multipath SMR and for a given number D of multipath delays, calculating the range error, for multipath in phase with a simulated line-of-sight signal and for multipath 180° out of phase with said simulated line-of-sight signal, thereby obtaining a vector y comprising 2D range error values,
- calculating, for each of the 2D range errors, the M+N+1 correlation values, and normalizing said correlation values by the correlation value I_0 of said punctual replica P_0, to obtain a (2D X (M+N+1)) matrix C,
- calculating the α_i values by solving the system of equations [[:]] y=C.α, wherein α is a vector comprising the M+N+1 α_i values.